Garmin GPS & Olympic Marmot Monitoring: The 3 Things You Really Need to Know

1. **Find your survey units**

   Receivers are loaded with topographic background map information. Marmot related polygons have been loaded and labeled with a waypoint indicating the Survey Unit number. These numbers correspond to the unit numbers on the paper maps. You will use the GPS, paper maps, and compass to find your units. The boundaries of the survey unit as shown on the GPS are greatly simplified due to data storage and display limitations of the units. If you are unsure if a marmot or burrow is inside a survey unit, record it and we can determine if it is later.

   a. Use the paper maps and compass to get yourself near the survey unit. Do not rely on the GPS unit's compass.
   b. Use the PAGE key to scroll to the MAP screen
   c. You will see a black triangle – that is your location. When you first access the screen, the triangle will be in the middle of the screen. If here is a number next to the triangle, there is a waypoint behind the triangle. The number is not directly related to your location.
   d. Use the IN and OUT keys to zoom in or out until you see the survey unit that you are looking for. At the bottom left of the screen is a map scale. If you zoom in too much, the map contour lines will not be visible. If you zoom out too much, the screen will become cluttered and you won't be able to find the unit in question.
   e. You can move the map left or right and up or down on the screen with the arrow keys.
   f. If you are outside the survey unit, walk in the correct direction until you find your way into it. If you are not sure which way you need to travel, you can simply wander about and watch the black triangle until you figure out which way to go, or you can use the GPS compass feature, or a real compass to figure out the direction.
   g. If you choose to use the GPS compass, be aware that the unit does not have a magnetic compass built in. Rather, it uses changes in your position to determine direction. Thus, you need to be moving to use the compass feature.
   h. You can see when you are in the survey unit by the position of the black triangle relative to the unit boundaries.

2. **Record your track while surveying (i.e., record a TRACK LOG)**

   You should record a **TRACK LOG** while surveying so that we will be able to see how thoroughly you covered the unit and so we can see how you got to the unit, possibly providing a route for other parties to use.

   Your unit is always recording an **ACTIVE TRACK LOG**. You need to create a **SAVED TRACK LOG** for each area that you survey. For example, if you survey units at Hurricane Hill and some at the Visitor Center, you should create a separate **SAVED TRACK LOG** for each area. To do this, as you leave the trail or camp to begin surveying:

   a. Turn the GPS unit ON.
   b. Press MENU twice to get to the Main Menu
   c. Select the Tracks icon (use arrow keys as needed)
   d. Push ENTER
   e. Scroll to the Clear button (use arrow keys)
   f. Push ENTER
   g. Scroll to "Yes" when prompted for clearing the track log
   h. Push ENTER
   i. Leave it on all the time you are surveying. You can turn it off while you eat lunch but remember to turn it back on when you start surveying again.
   j. At the end of the day or when finished with the cluster group (i.e., Hurricane Hill), scroll to the Save button
   k. Scro1l to "Yes" when prompted for saving the entire track log
   l. Push ENTER
   m. You can accept the default track name (date and sequential number if more than one track is saved per date)
   n. Scroll to OK
   o. Push ENTER

3. Record marmots and burrows as WAYPOINTS

You should record representative locations of marmots and burrows that you find. You should record these in the GPS unit, as a **WAYPOINT** and on the appropriate data sheet.

a. Use the PAGE key to scroll through screens until you find the Satellites screen.
b. Wait until at least 4 satellites are indicated by bars at the bottom of the screen and the satellite icons darkening. If the estimated error in the location, shown in the upper left of the Satellites screen, is >10 m, wait a few minutes until a better location fix is obtained.
c. Once a satisfactory location fix is obtained, press and hold the MARK button until the Mark Waypoint screen appears
d. Scroll to the waypoint name field at the top
e. Push ENTER
f. Use the on-screen keypad to enter the waypoint name. Label waypoints indicating marmots or burrows as follows:
    a. Marmot(s): VOL#-SURVEY UNIT#-MAR
    b. Occupied burrow(s): VOL#-SURVEY UNIT#-OB
    c. Abandoned burrow(s): VOL#-SURVEY UNIT#-AB
    d. Other point of interest: VOL#-SURVEY UNIT#-OTH (note on data form what the point represents)
g. Scroll to OK
h. Push ENTER
i. Record the UTMs from the marked waypoint onto the data sheet. Do not record the UTMs on the data sheet and then mark the waypoint. The GPS unit is continuously refining the location and we want the units recorded in the GPS to be the same as those recorded on the paper.

Other things you should know

Power On and Off

- Push power button at the top of the unit (to the right of the external antenna) for ~2 seconds to turn on receiver
- Push the power button for about two seconds to turn off the unit

Batteries

- The unit uses two AA batteries. The battery compartment is located on the back of the unit.
- Two alkaline batteries should last approximately 6-8 hours with minimal backlight use

Backlight

- Briefly (about one second) push the power button after the unit has been turned on to activate the backlight
- The backlight can be adjusted by using the up and down scroll buttons
- The backlight is set to automatically turn off after 15 seconds

Receiver Screens

- The PAGE button scrolls through various screens. The screens that will be used most are the satellite chart and position screen and the background map.
- The IN and OUT buttons zoom the map display in and out. The display zooms in as far as 5 meters.
- The QUIT key steps back through previous screens.
- Look for the Satellite Status screen. This shows how many satellites are being tracked via solid bars in the graph and in the circular sky plot. The upper left corner satellite icon shows whether the location is in 2D OR 3D. Coordinates are more accurate if there are 4 or more satellites being tracked and location is in 3D.
- Location information is displayed in the Satellite page above the sky plot graphic.
    - Coordinates are set to display as UTM zone 10N, North American Datum 1983 (NAD 83)
    - The “10” and “U” or “T” indicate the coordinates are in UTM zone 10 North
    - The six digit number indicates the UTM easting coordinate and the seven digit number below the easting indicates the seven digit northing coordinate.
    - The +/- indicates the approximate error radius (meters) of the currently calculated UTM position
- Elevation (feet) displays on the Satellite page if you
    - push MENU,
    - scroll to GPS Elevation,
    - push ENTER
    - Scroll to OK
    - push ENTER to close the pop-up screen

The coordinates for the current location and the elevation are also displayed on the Trip Computer screen